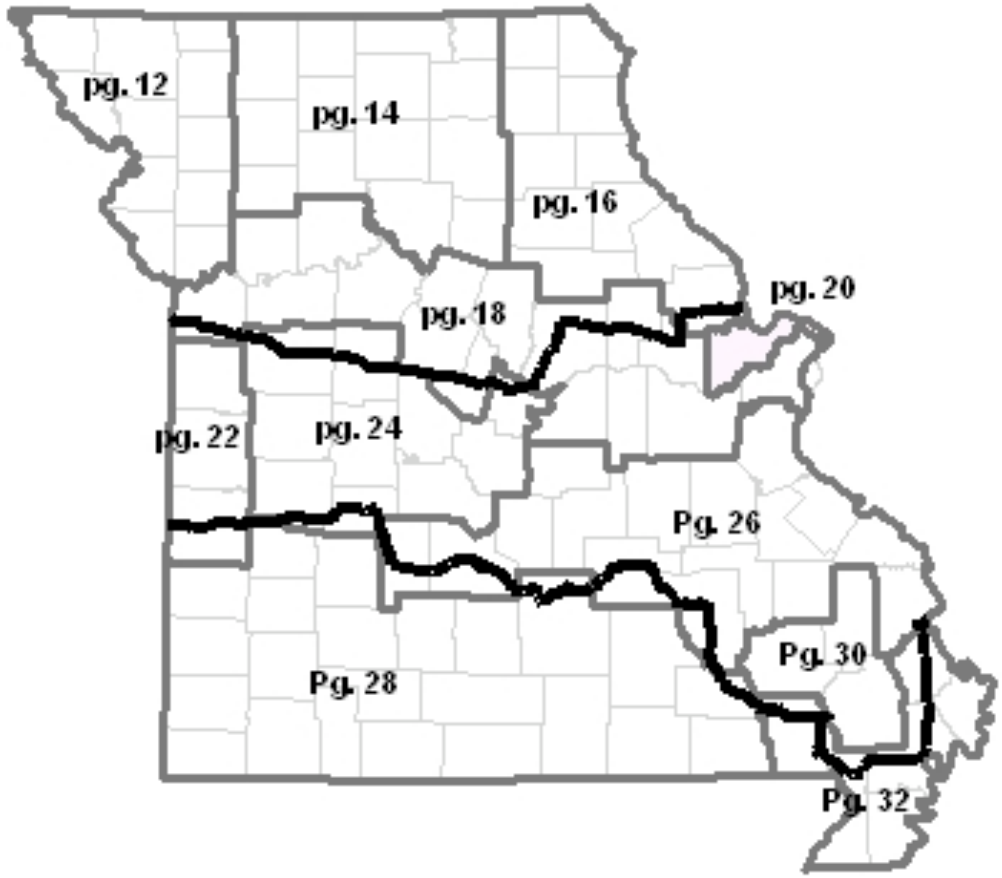
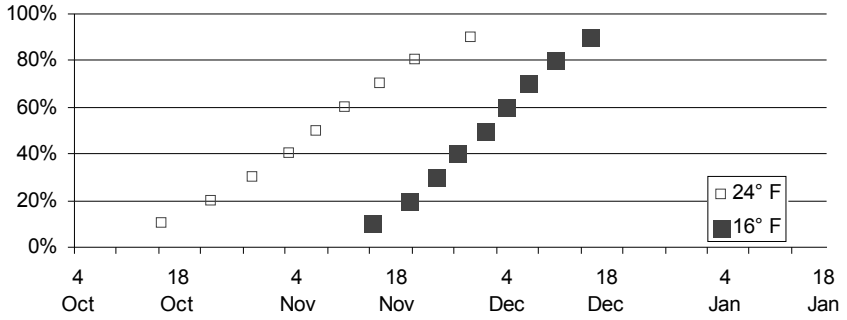
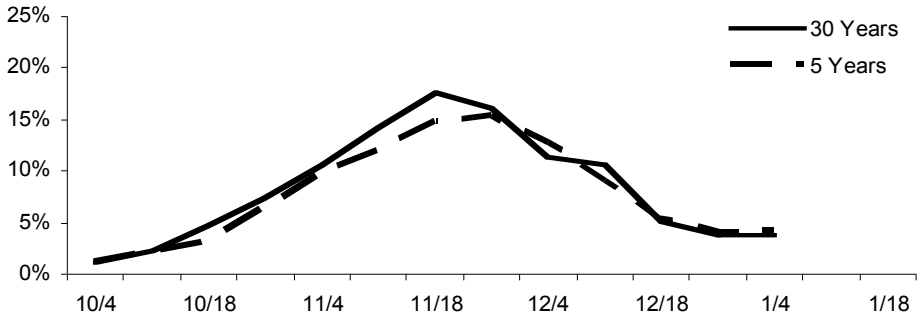
WEATHER, POPULATION, AND HARVEST TRENDS IN 11 REGIONS OF MISSOURI



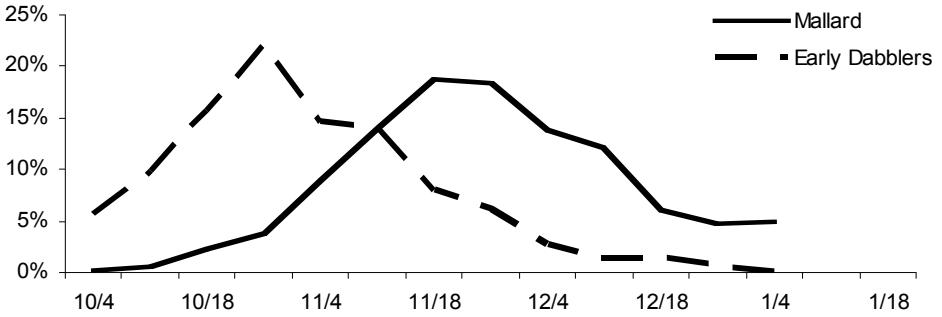
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Oregon, MO.



Percent of duck use by week (Squaw Creek NWR, Bob Brown CA, and Nodaway Valley CA): 30- year average and 5-year average.

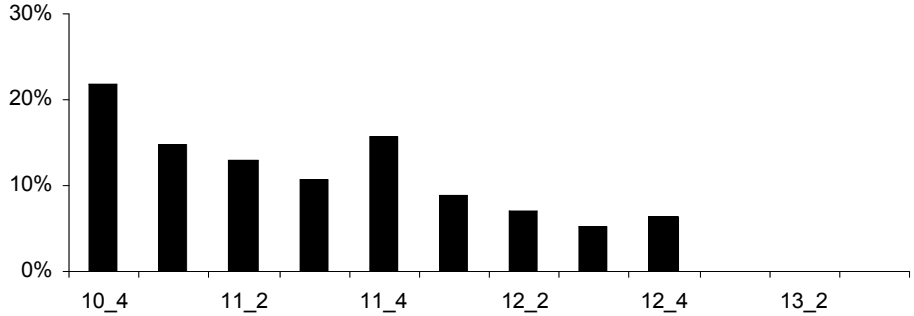


Percent of mallard and early migrant use by week (Squaw Creek NWR, Bob Brown CA and Nodaway Valley CA): 30-year average.

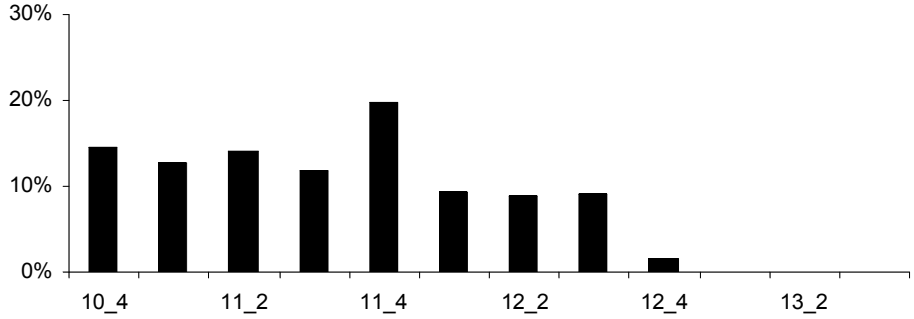


NORTHWEST: In Northwest Missouri, precipitation gradually declines from late summer through fall. Average low temperatures declines below freezing by mid-November. There is a 50% probability of achieving a low temperature of 24° F by November 7, by December 1, there is a 50% chance of a low temperature of 16° F, and a 90% chance of 16° F by December 22. The pattern of duck use at Squaw Creek NWR, Bob Brown CA, and Nodaway Valley CA shows a gradual buildup in duck use through mid-November and a slightly sharper decline during late November and December. Peak numbers occurred slightly later during 2001-2005 compared with the 30-year average. Early migrants use typically peaks during mid to late October and declines through November. Mallard numbers peak during mid to late November and decline through December as ice conditions develop.

Average daily harvest per week in the Squaw Creek Region based on FWS harvest estimates: 1997-2004.

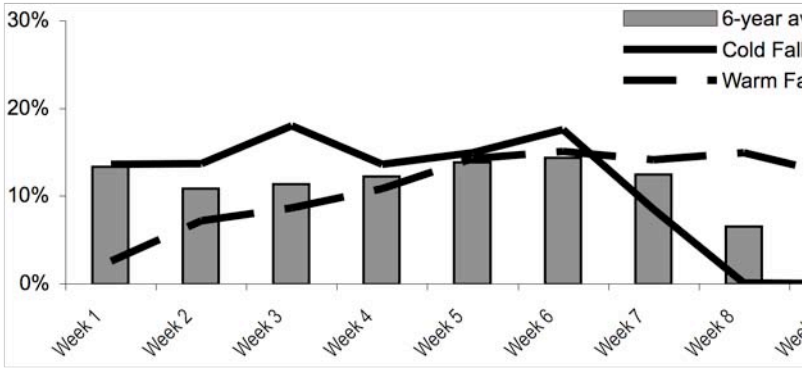


Average daily band recoveries per week in the Squaw Creek Region: 1997-2004 (n=330).

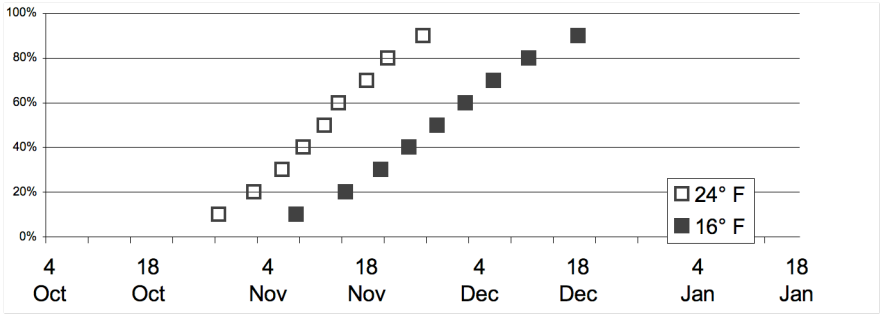


NORTHWEST HARVEST: The Northwest Region accounted for 8% of the U.S. Fish and Wildlife (FWS) statewide harvest estimate and 6% of statewide duck band recoveries during 1997-2004. The FWS estimate suggests that the highest harvest occurs early in the season with a second peak at the end of November. Band recoveries were fairly consistent through the entire season with a peak in late November. Average daily harvest over the past 6 years at Bob Brown CA and Nodaway Valley CA remained stable until the last 2 weeks of the season. In cold years, this region has the potential to freeze early and limit harvest opportunity. In 2005, ice by early to mid-December ended hunting on most shallow water habitat; however, water did open up when unseasonably warm temperatures occurred in late December and throughout January.

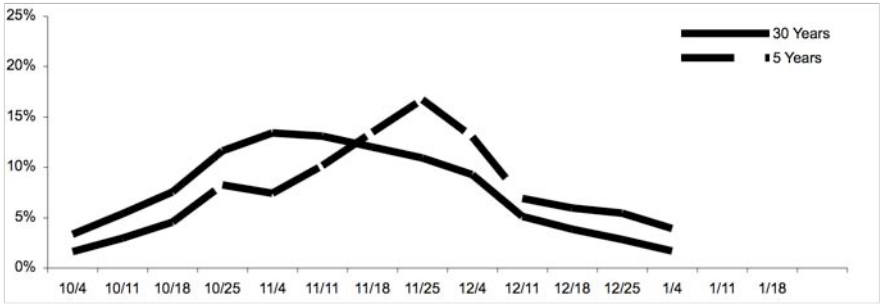
Percent of CA daily hunter trips by week of season at Bob Brown CA and Nodaway Valley CA: 2000-2005.



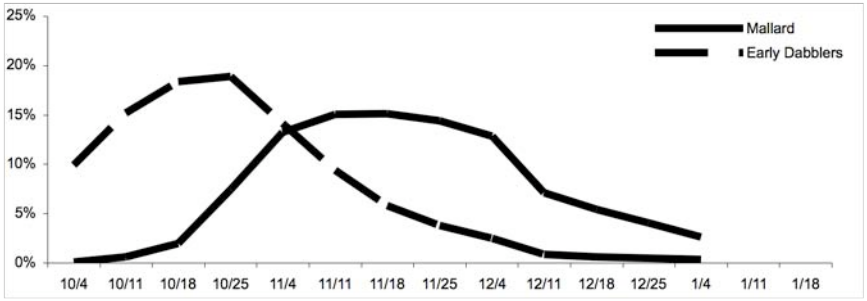
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Brookfield, MO.



Percent of duck use by week (Fountain Grove CA and Swan Lake NWR): 30- year average and 5-year average.

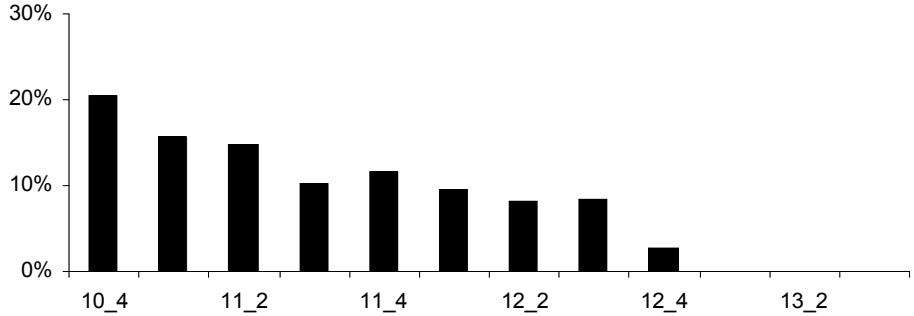


Percent of mallard and early migrant use by week (Fountain Grove and Swan Lake NWR): 30-year average.

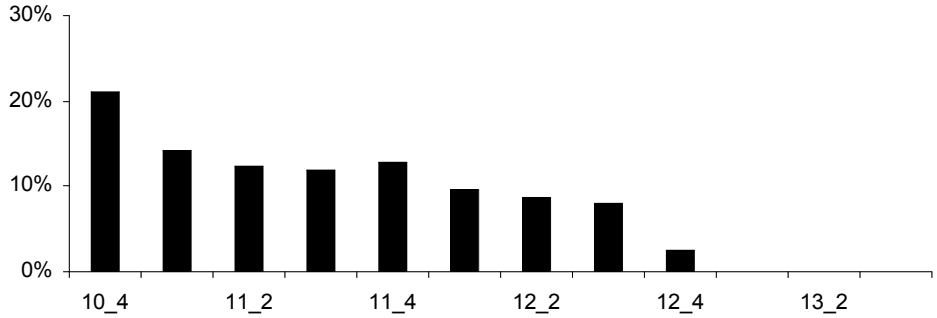


NORTH-CENTRAL: Precipitation patterns in North-Central Missouri, although greater in magnitude, are similar to Northwest Missouri with gradual declines after September. Freezing conditions initially occur during mid-November and there is a 50% probability for a low temperature of 24° F occurring by November 12. By December 2 there is a 50% chance of a low temperature of 16° F. Duck use at Fountain Grove CA and Swan Lake NWR during the last five years was later than compared to the long-term average. Late October weather fronts that bring early mallard flights often result in declining numbers of early season migrants such as green-winged teal, pintail and wigeon.

Average daily harvest per week in the North-Central Region based on FWS harvest estimates: 1997-2004.

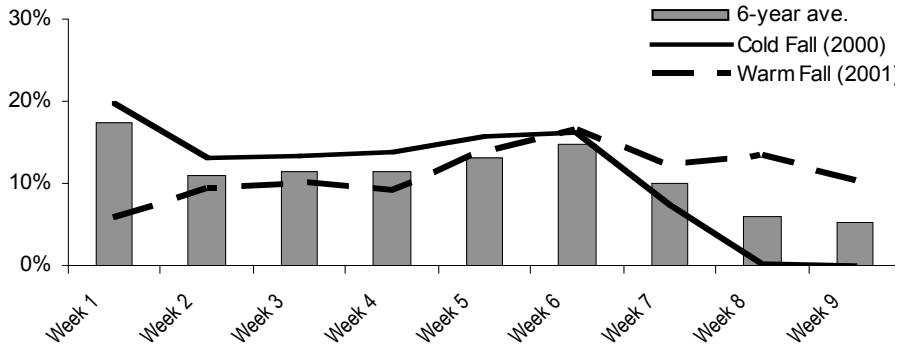


Average daily band recoveries per week in the North-Central Region: 1997-2004 (n=511).

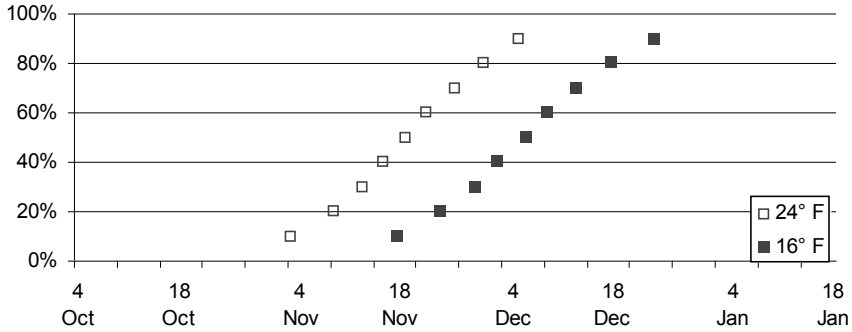


NORTH-CENTRAL HARVEST: This region accounted for 11% of the statewide FWS harvest estimate and 10% of statewide band recoveries during 1997-2004. Harvest estimates and band recoveries indicate that the highest portion of harvest occurs early in the season. By mid-December harvest begins to decline. At Fountain Grove, the average number of daily hunter trips per week and harvest also declines by mid-December as shallow water habitat begins to freeze. However, hunter trips and harvest are maintained through late season during mild winters when open water remains available.

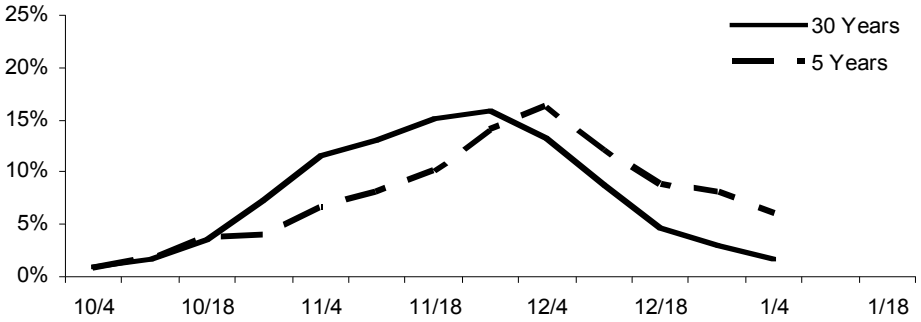
Percent of CA daily hunter trips by week of season at Fountain Grove CA: 2000-2005.



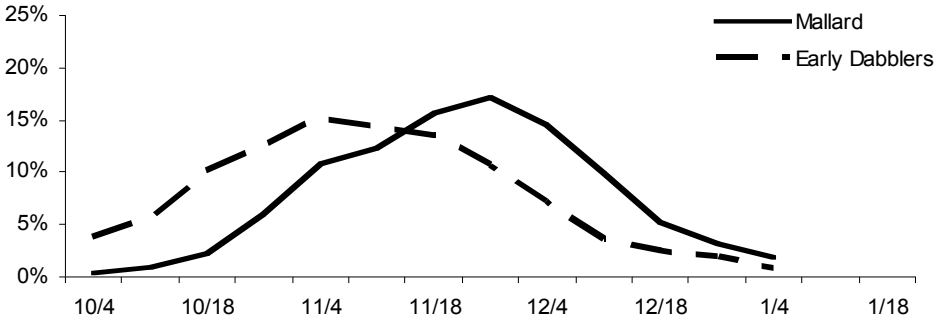
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Saverton, MO.



Percent of duck use by week (Ted Shanks CA, B.K. Leach CA, and Marais Temps Clair CA): 30- year average and 5-year average.

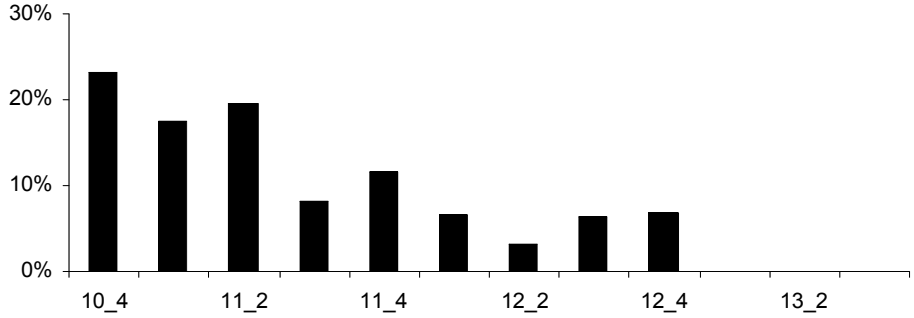


Percent of mallard and early migrant use by week (Ted Shanks CA, B.K. Leach CA and Marais Temps Clair CA): 30-year average.

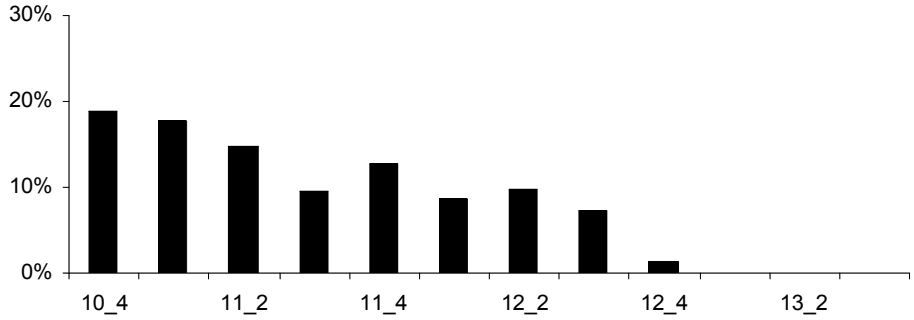


NORTHEAST: Similar to the rest of North Missouri, precipitation gradually declines throughout the fall and early winter, although not as dramatically as in the Northwest. Freezing conditions do not consistently occur until early December. There is a 50% probability of seeing a low temperature of 24° F by November 19, over a week later than in the Northwest. By December 6 there is a 50% chance of seeing a minimum temperature of 16° F. During the past five years, peak duck use during early December is similar, but slightly later than the long-term average. Early migrant influx is not as pronounced as in Northwest and North Central Missouri. Mallard use drops off fairly dramatically during mid-December.

Average daily harvest per week in the Northeast Region based on FWS harvest estimates: 1997-2004.

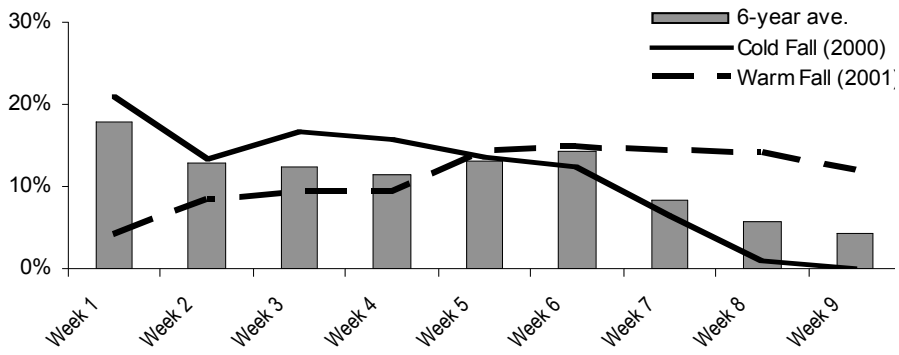


Average daily band recoveries per week in the Northeast Region: 1997-2004 (n=498).

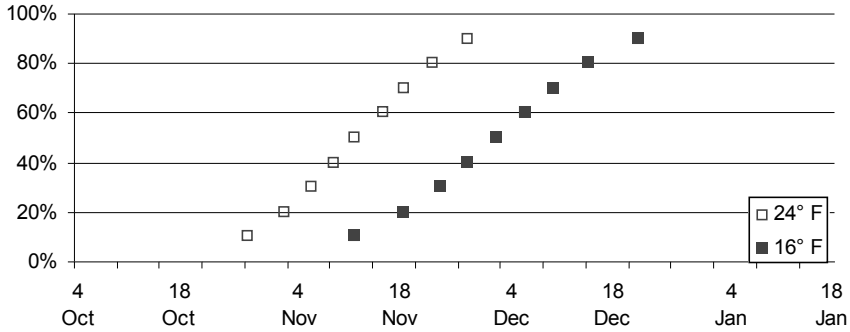


NORTHEAST HARVEST: This region accounted for 13% of the statewide FWS harvest estimate and 9% of statewide band recoveries from 1997-2004. The timing of harvest follows a similar pattern as in North-Central and Northwest Missouri with the greatest proportion of the harvest occurring during early season. The potential for late season "boom or bust" hunting is present through all of North Missouri. For example, in 2000 most of the harvest occurred before the end of November at Ted Shanks. In 2001, a much milder year, most of the harvest did not occur until the end of November and into December.

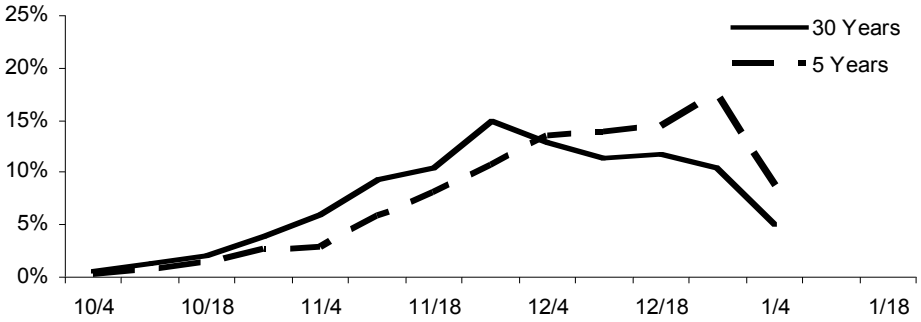
Percent of CA daily hunter trips by week of season at Ted Shanks CA: 2000-2005.



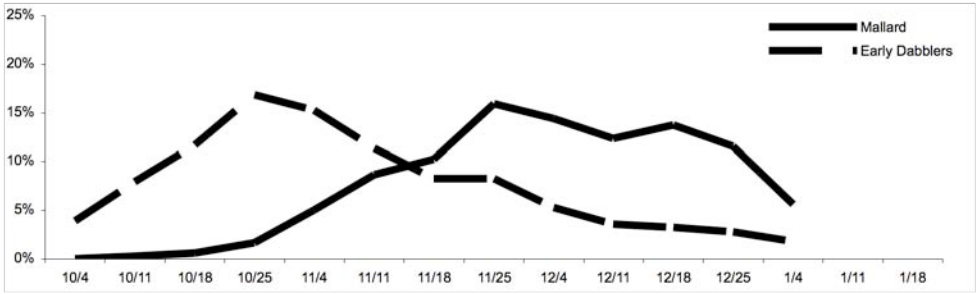
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Columbia, MO.



Percent of duck use by week (Grand Pass CA and Eagle Bluffs CA): 30- year average and 5-year average.

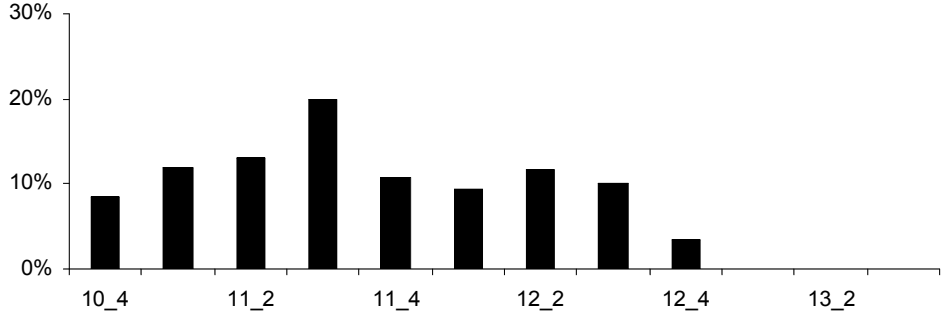


Percent of mallard and early migrant use by week (Grand Pass CA and Eagle Bluffs CA): 30-year average.

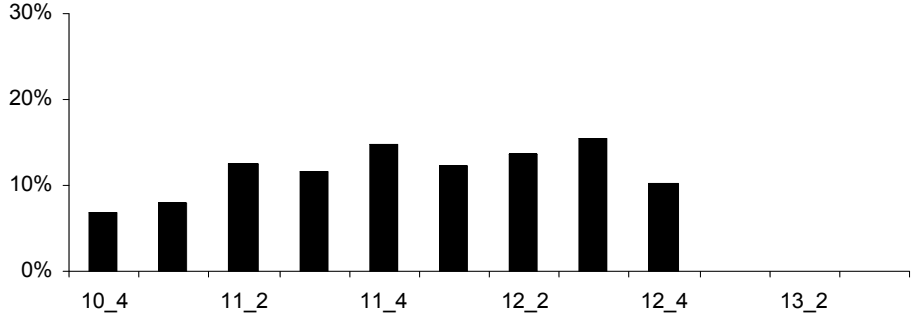


CENTRAL: Precipitation patterns in the Central Region are similar to Northwest Missouri, only greater in magnitude. On average, freezing conditions occur a few days later than in the Northwest and a few days earlier than in the Northeast. There is a 50% probability of seeing a low temperature of 24° F by November 12, and by December 2 there is a 50% chance of seeing a minimum temperature of 16° F. Late season use associated with Grand Pass and Eagle Bluffs CAs is apparent in the Central Region. As expected, use during December is primarily by mallards.

Average daily harvest per week in the Central Region based on FWS harvest estimates: 1997-2004.

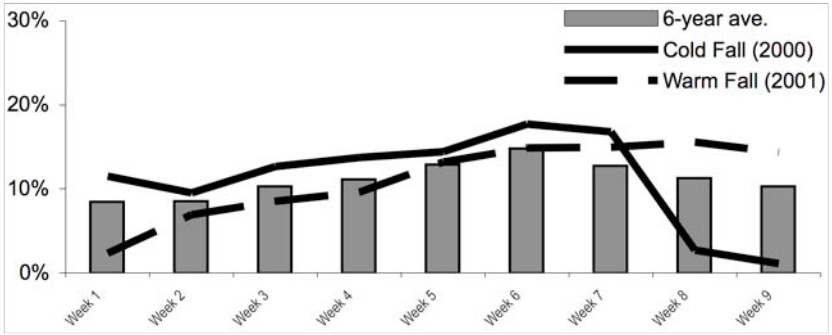


Average daily band recoveries per week in the Central Region: 1997-2004 (n=808).

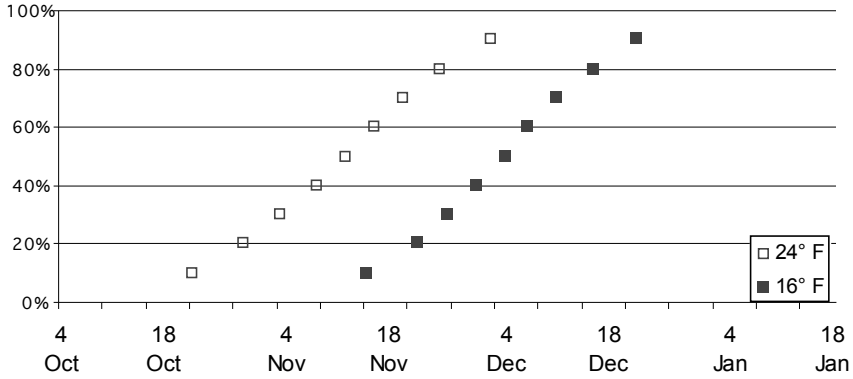


CENTRAL HARVEST: This region accounted for 8% of the statewide FWS harvest estimate and 15% of statewide band recoveries from 1997-2004. Unlike North Missouri, all harvest metrics indicate lower harvest during the first two of weeks of season, with a gradual increase through mid-season. While harvest declines slightly at Grand Pass and Eagle Bluffs, harvest in deep water habitat likely continues into late season.

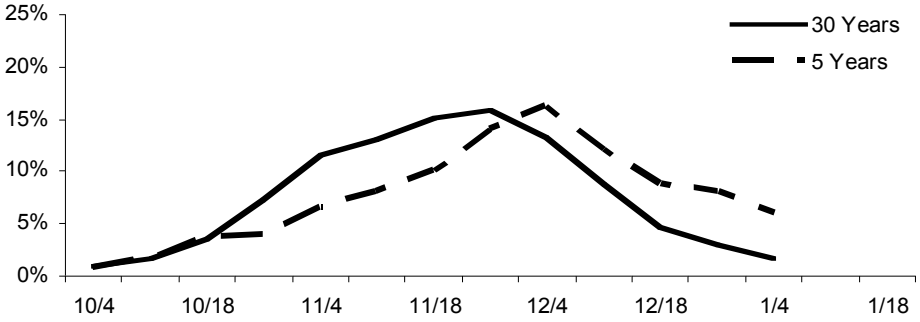
Percent of CA daily hunter trips by week of season at Grand Pass CA and Eagle Bluffs CA: 2000-2005.



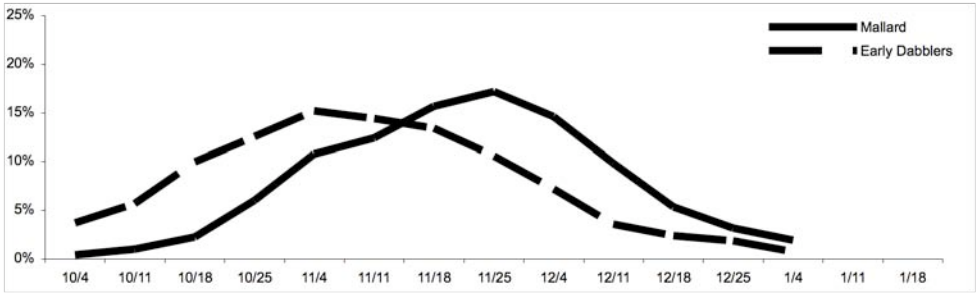
Probability (%) that a temperature of 24° F and 16° F will be reached by date at St. Charles, MO.



Percent of duck use by week (Ted Shanks CA, B.K. Leach CA, and Marais Temps Clair CA): 30- year average and 5-year average.

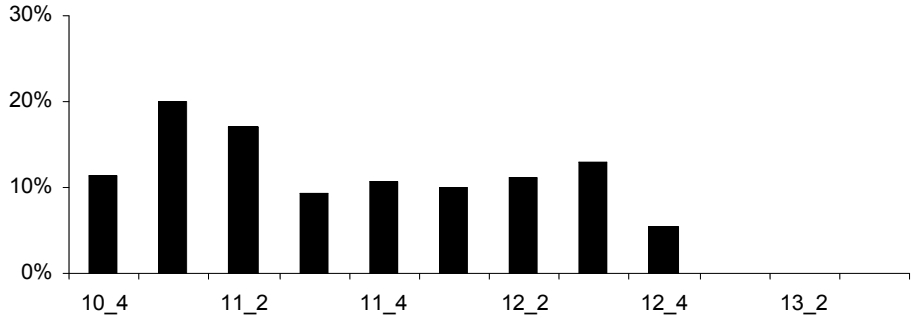


Percent of mallard and early migrant use by week (Ted Shanks CA, B.K. Leach CA, and Marais Temps Clair CA): 30-year average.

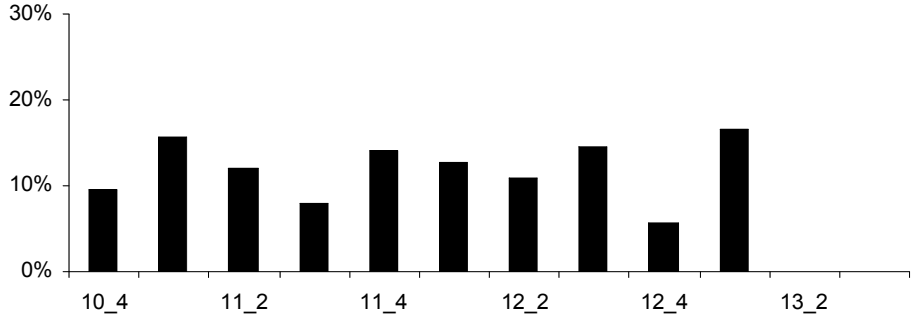


ST. CHARLES COUNTY: As in the rest of North Missouri, precipitation gradually declines throughout the fall and early winter. On average freezing conditions occur a few days later than Northwest Missouri. The 50% probability of seeing a low temperature of 24° F occurs by November 12, and by December 4 there is a 50% chance of seeing a minimum temperature of 16° F. Duck use at Ted Shanks CA, B.K. Leach, and Marais Temps Clair peaks from late November through early December. The peak for early migrants is the last week of October and first week of November.

Average daily harvest per week in St. Charles County based on FWS harvest estimates: 1997-2004.

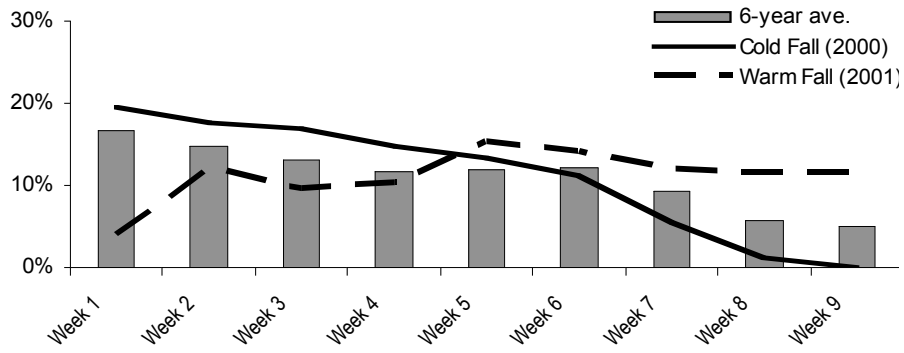


Average daily band recoveries per week in St. Charles County: 1997-2004 (n=459).

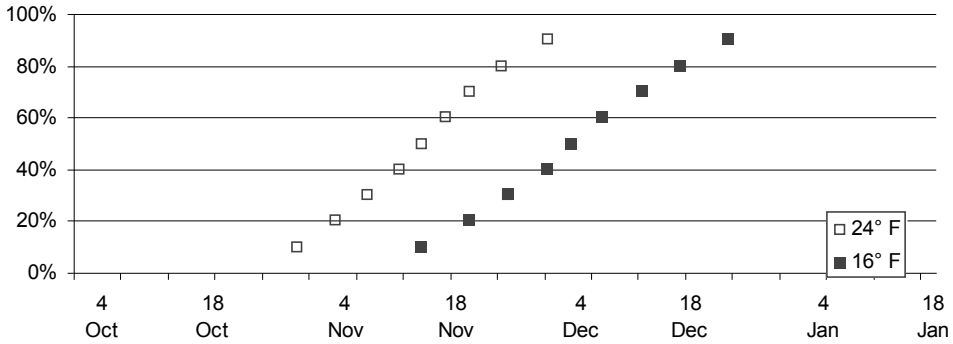


ST. CHARLES COUNTY HARVEST: Although this region includes only one county, it still accounted for 12% of the statewide FWS harvest estimate and 9% of statewide band recoveries during 1997-2004. After an initial period of high harvest during the first two weeks of November, hunter success remains variable through the remainder of the season. Hunting at B.K. Leach typically declines by mid-December. Band recoveries and FWS harvest estimates indicate that late season harvest also occurs as duck use shifts from shallow water habitat to remaining open water during late season.

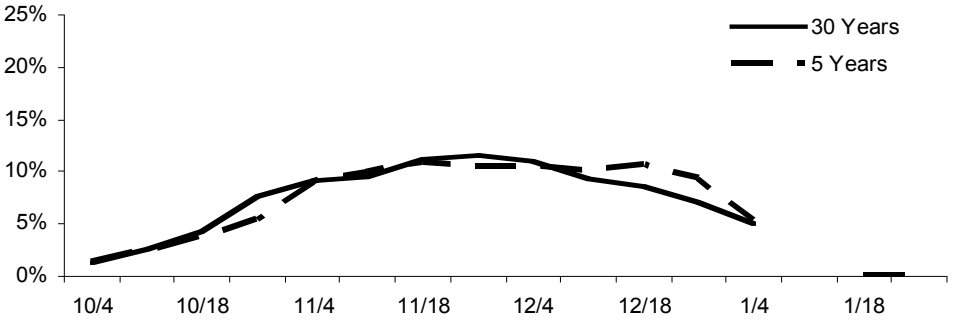
Percent of CA daily hunter trips by week of season at B.K. Leach CA: 2000-2005.



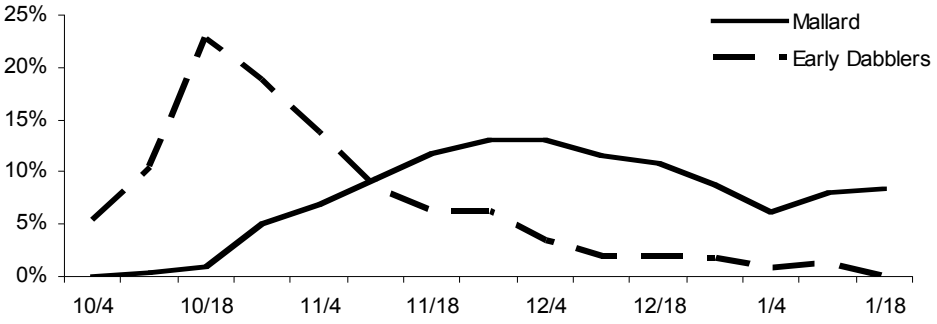
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Appleton City, MO.



Percent of duck use by week (Schell-Osage CA, Four Rivers CA, and Settle's Ford): 30- year average and 5-year average.

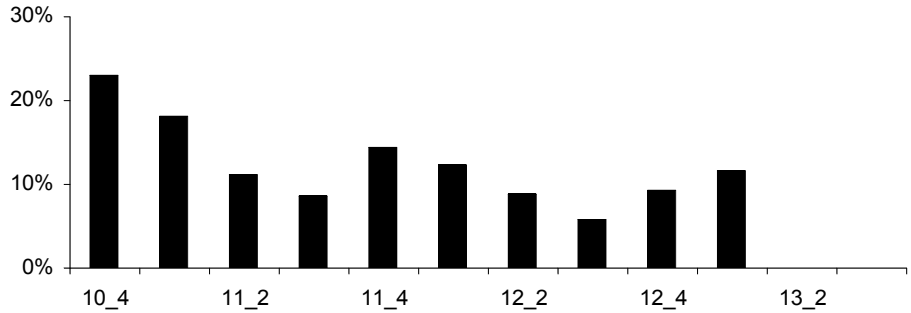


Percent of mallard and early migrant use by week (Schell-Osage CA, Four Rivers CA and Settle's Ford CA): 30-year average.

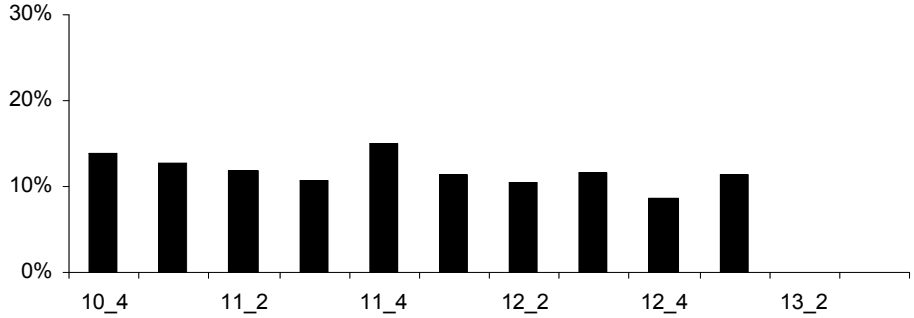


WEST-CENTRAL: Higher mean precipitation is sustained later into the fall in West-Central Missouri than in the North, and average low temperatures occur a few days later. A 50% probability of seeing a low temperature of 24° F occurs by November 14, and a 50% chance of 16° F occurs on December 3. Data from Schell-Osage, Four Rivers, and Settle's Ford CAs indicate a sharp rise in early migrant use by mid-October followed by a more gradual buildup and sustained use by mallards through December during most years. The pattern of total duck use during the past five years is similar to the long-term average. Early migrant numbers are high during mid-October and decline sharply by early to mid-December. Mallard use is consistent through early January.

Average daily harvest per week in the West-Central Region based on FWS harvest estimates: 1997-2004.

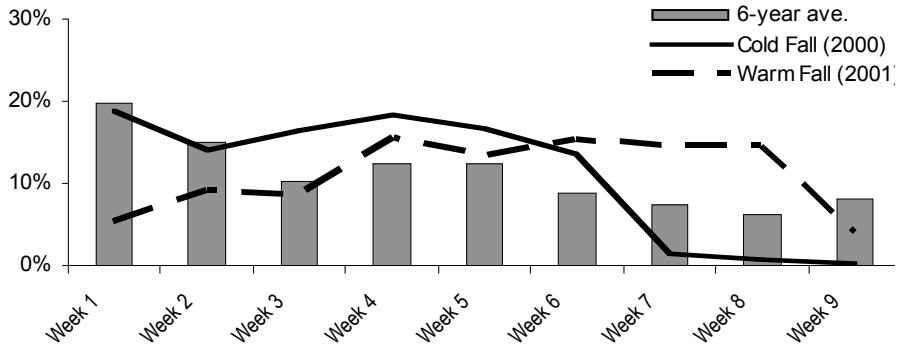


Average daily band recoveries per week in the West-Central Region: 1997-2004 (n=481).

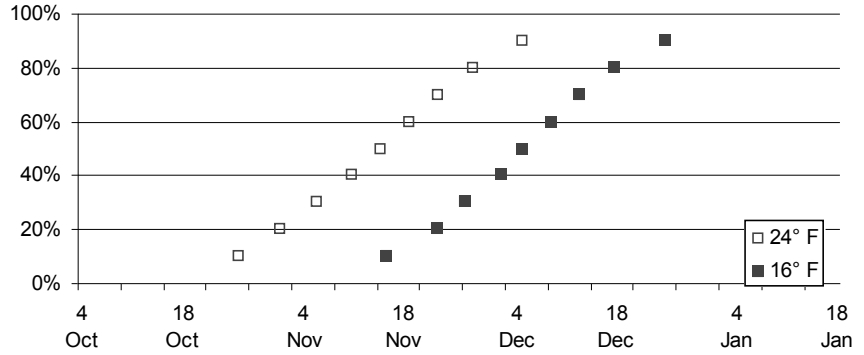


WEST-CENTRAL HARVEST: The West-Central Region accounted for 10% of the statewide FWS harvest estimate and 9% of statewide band recoveries during 1997-2004. FWS harvest estimates and harvest data from Schell-Osage and Four Rivers suggest the highest harvest occurs early in the season followed by another small peak in late November. These two periods coincide with timing of key migration periods. Unlike North Missouri, over the last 8 years this region has experienced similar levels of harvest during the last week of the season as during earlier periods of the season.

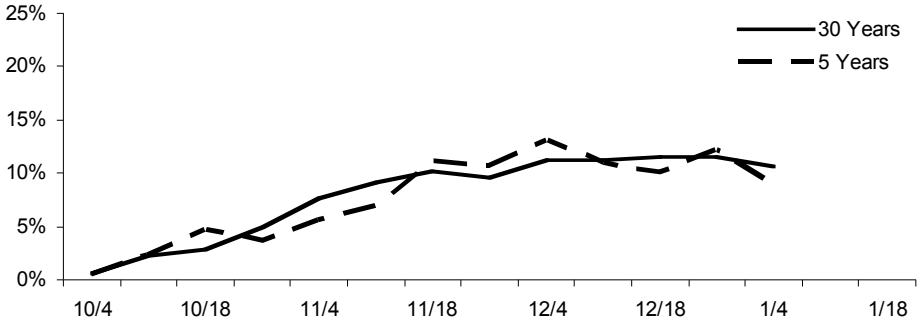
Percent of CA daily hunter trips by week of season at Schell-Osage CA and Four Rivers CA: 2000-2005.



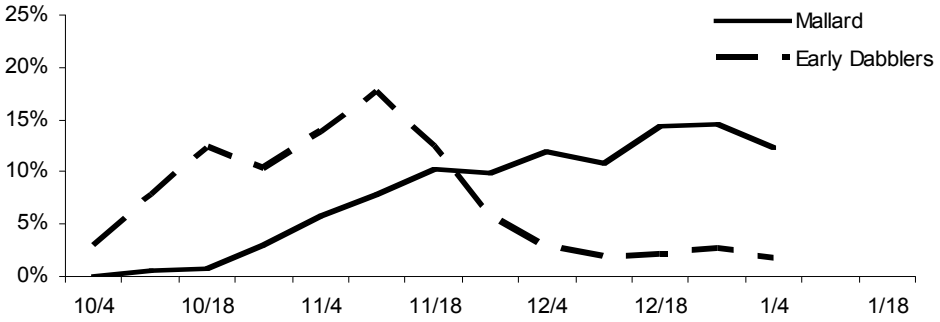
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Eldon, MO.



Percent of duck use by week (Montrose CA): 30- year average and 5-year average.

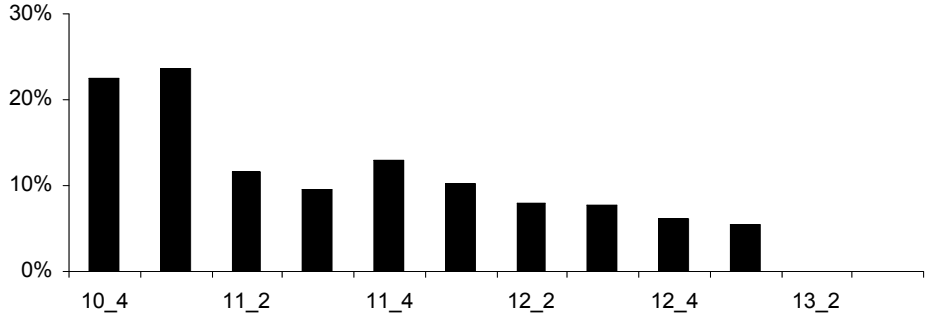


Percent of mallard and early migrant use by week (Montrose CA): 30-year average.

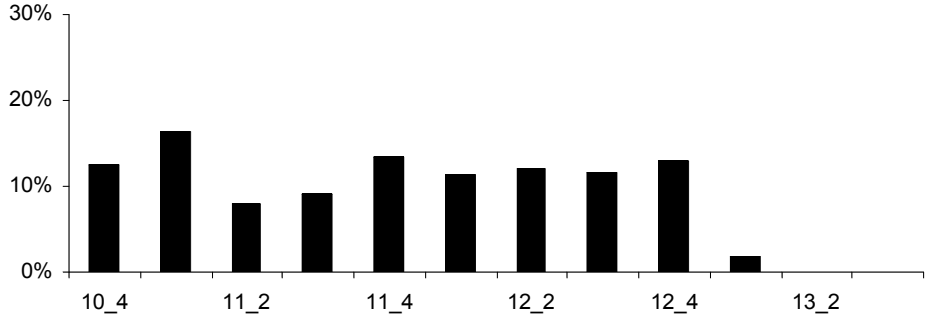


CENTRAL RESERVOIRS: Following a decline in average monthly precipitation from September, rainfall amounts are relatively consistent through November. Mean low temperatures are similar to West Central Missouri, but reservoirs and the Osage River consistently provide open water during late season. A 50% probability of seeing a low temperature of 24° F occurs by November 15, and by December 5 there is a 50% chance of seeing a minimum temperature of 16° F. Early migrant use patterns are similar to Schell-Osage with a peak in early to mid-November. Mallards peak in mid-December to early January. Duck use patterns during the past five years appear to be similar to the long-term average.

Average daily harvest per week in the Central Reservoirs Region based on FWS harvest estimates: 1997-2004.

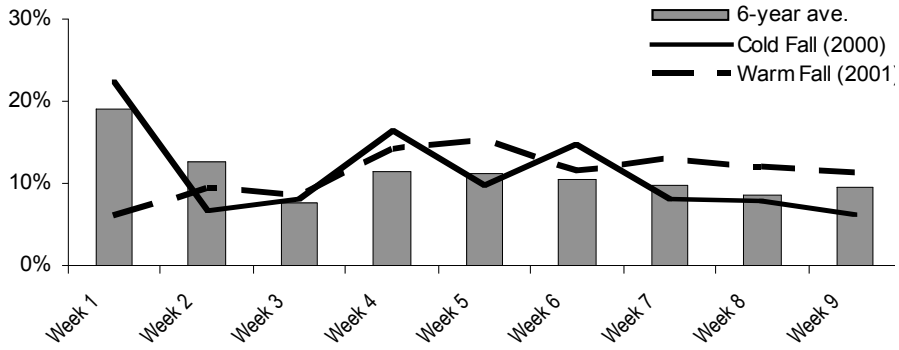


Average daily band recoveries per week in the Central Reservoirs Region: 1997-2004 (n=478).

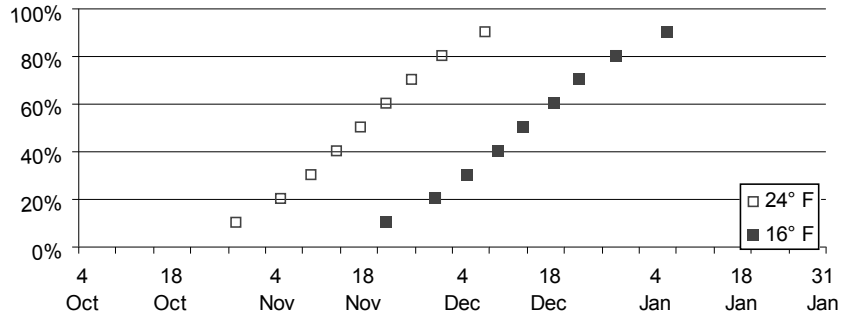


CENTRAL RESERVOIRS HARVEST: This region accounted for 11% of the statewide FWS harvest estimate and 9% of statewide band recoveries from 1997-2004. The highest harvest occurred during the last week of October and the first week of November. This early season peak in harvest is partially the result of increased hunter effort during the opening week of season. Harvest and hunter effort at Montrose in 2000 compared to Conservation Areas with only shallow water highlights the differences in hunter effort and harvest patterns between shallow water and deep water habitat. In 2000, most shallow water froze up by early December. Hunting effort and success increased during this time at Montrose, while most shallow water hunting had ended.

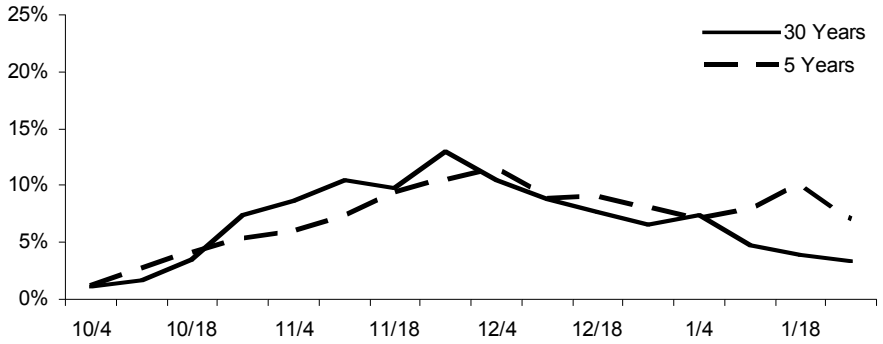
Percent of CA daily hunter trips by week of season at Montrose CA: 2000-2005.



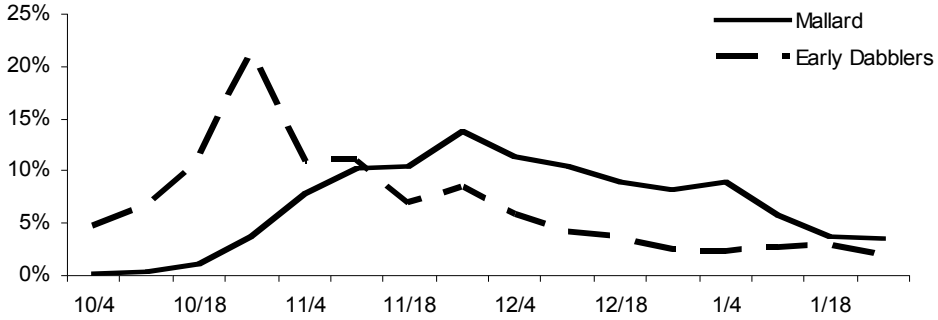
Probability (%) that a temperature of 24° F and 16° F will be reached by a certain date at Cape Girardeau, MO .



Percent of duck use by week (Duck Creek CA, Otter Slough CA, and Mingo NWR): 30- year average and 5-year average.



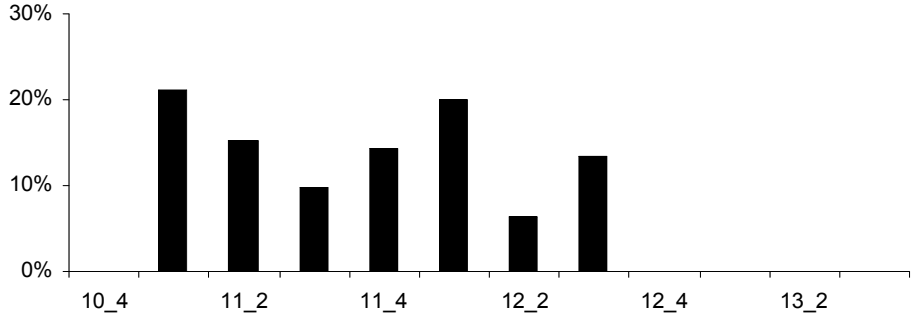
Percent of mallard and early migrant use by week (Duck Creek CA, Otter Slough CA and Mingo NWR): 30-year average.



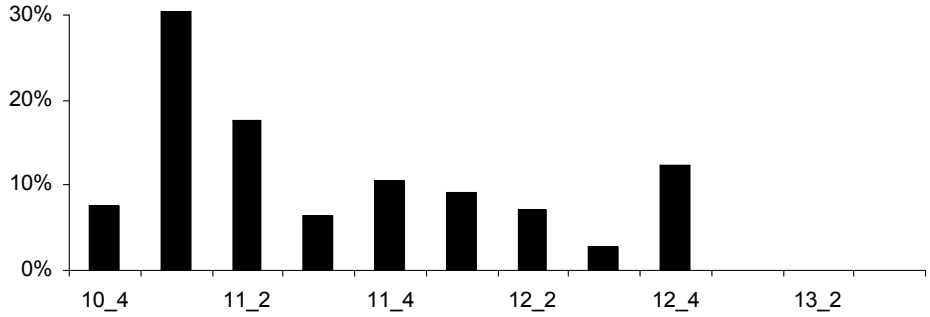
EAST-CENTRAL: The trend of sustained precipitation into the fall is apparent in East-Central Missouri. On average, there is little change from early fall through early December. Although backwaters and floodplain depressions freeze by mid-December, rivers remain open through December most years. There is a 50% probability of seeing a temperature as low as 24° F by November 18, and 16° F by December 14.

There are no managed wetland areas in this area so population data from Duck Creek, Otter Slough and Mingo are shown to reflect the general pattern of use. However, the lack of managed areas and suitable duck habitat limits sustained duck use throughout the area.

Average daily harvest per week in the East-Central Region based on FWS harvest estimates: 1997-2004.

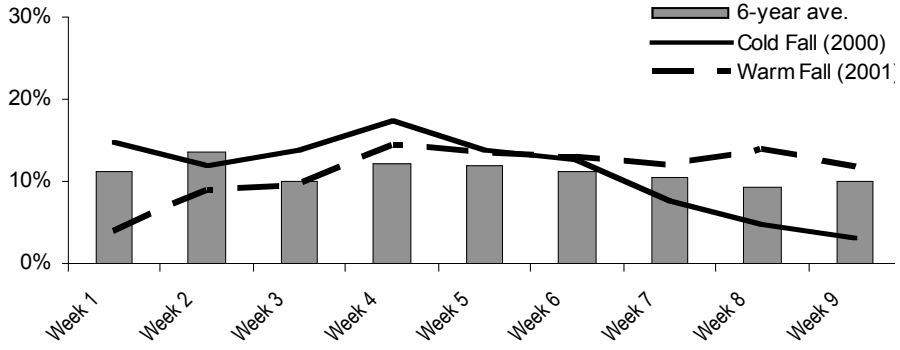


Average daily band recoveries per week in the East-Central Region: 1997-2004 (n=57).

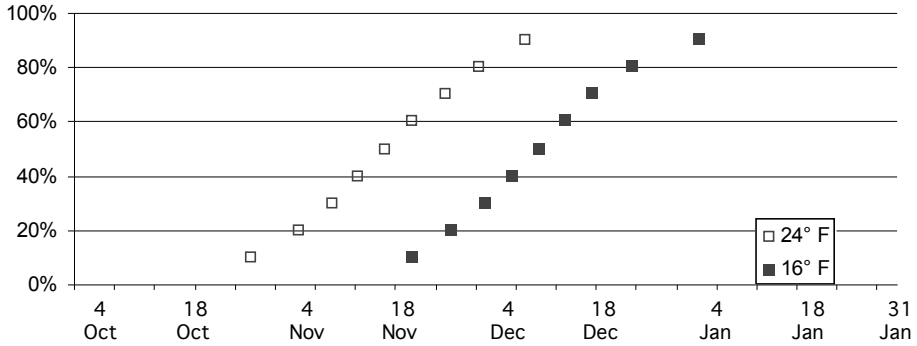


EAST-CENTRAL HARVEST: This region accounted for less than 1% of the statewide FWS harvest estimate and 1% of statewide band recoveries during 1997-2004. Harvest is likely limited to wood ducks and early season migrants during the early season with some mallards later in the season.

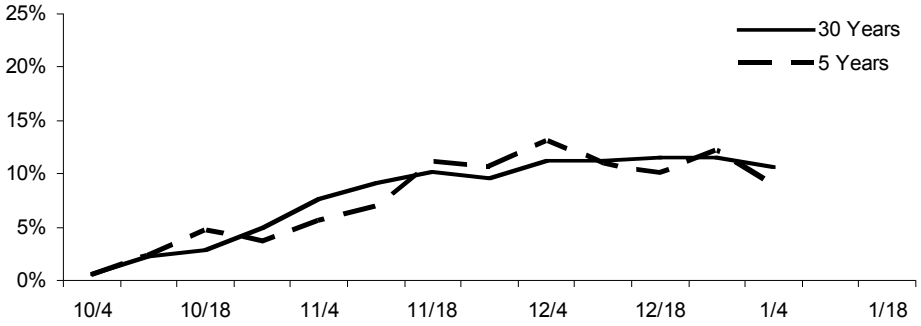
Percent of CA daily hunter trips by week of season at Duck Creek CA and Otter Slough CA: 2000-2005.



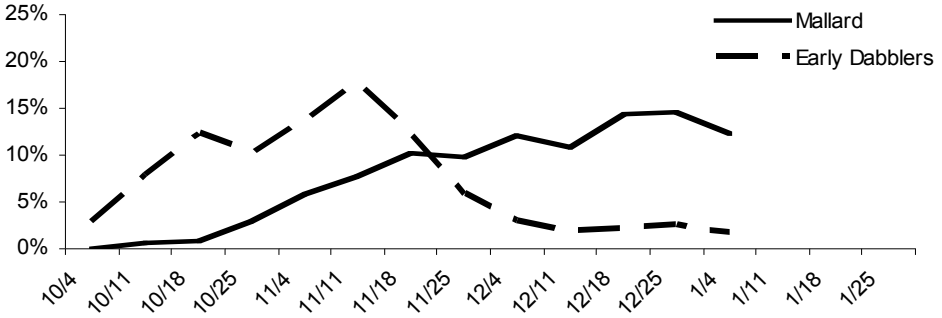
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Joplin, MO.



Percent of duck use by week (Montrose CA): 30- year average and 5-year average.

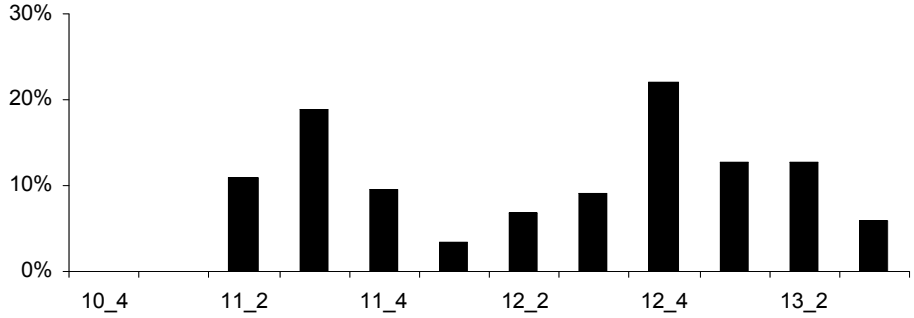


Percent of mallard and early migrant use by week (Montrose CA): 30-year average.

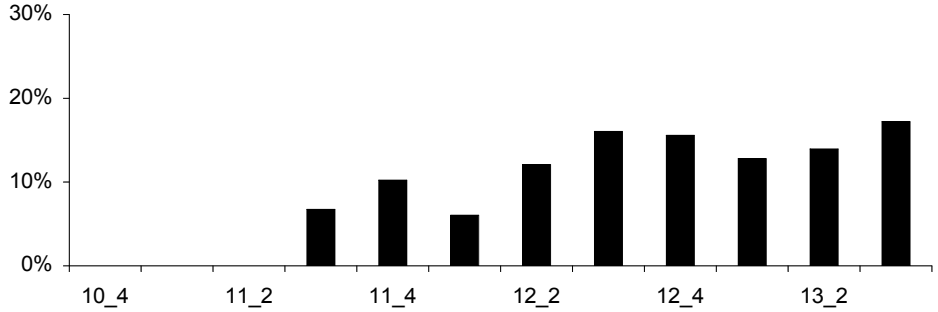


SOUTH: Average precipitation declines in this area from early fall through winter, although September rainfall generally is greater than North Missouri. There is a 50% probability of a temperature as low as 24° F occurring by November 16 and 16° F by December 9. No long-term migration or population data are available for this portion of Missouri; therefore, information from Montrose CA, a deep water reservoir to the north, is used to reflect expectations for duck availability. Shallow water wetlands are found mostly in prairie areas (north and western parts) of this area. Otherwise deep reservoirs, irrigation lakes and rivers provide late season habitat for ducks. Populations of ducks, mallards in particular, remain well into the winter as long as open water and food are available.

Average daily harvest per week in the South Region based on FWS harvest estimates: 1997-2004.

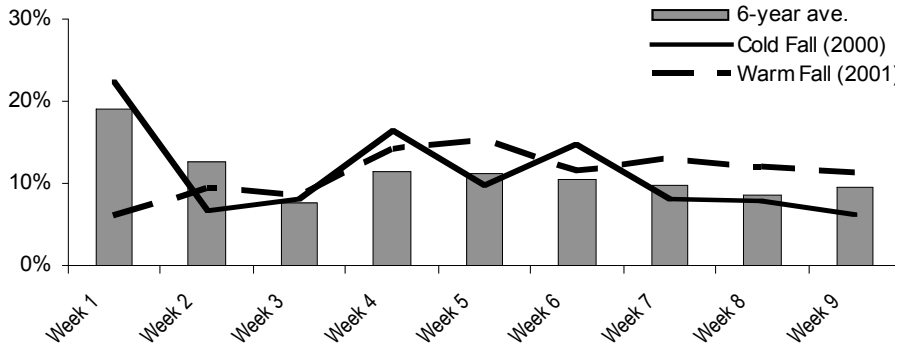


Average daily band recoveries per week in the South Region: 1997-2004 (n=269).

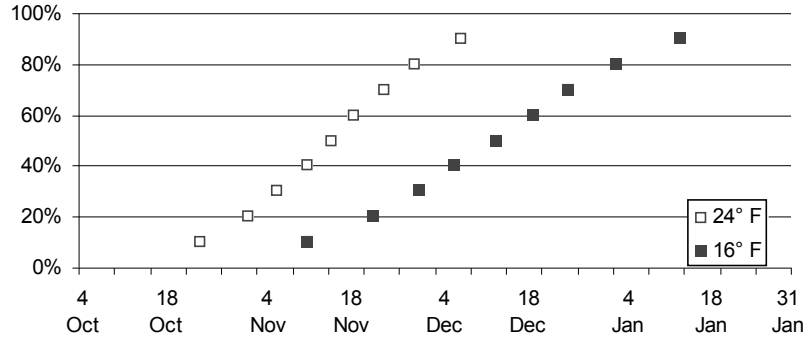


SOUTH HARVEST: South Missouri accounted for 5% of the statewide FWS harvest estimate and 5% of statewide band recoveries during 1997-2004. FWS harvest estimates suggest a peak in mid-November followed by a second peak in late December. Band recoveries suggest more consistent and better hunting during late season.

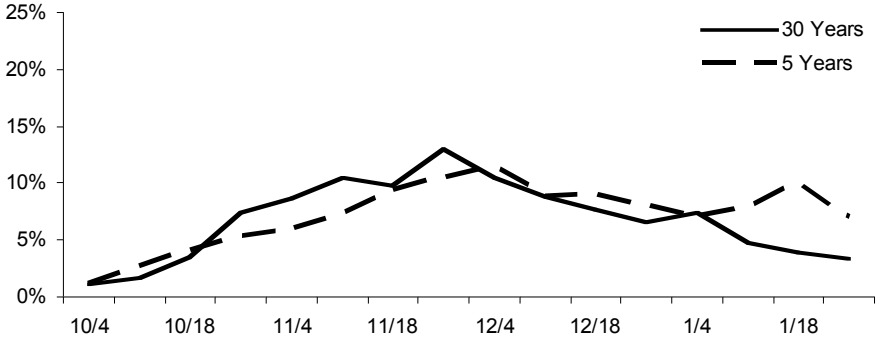
Percent of CA daily hunter trips by week of season at Montrose CA: 2000-2005.



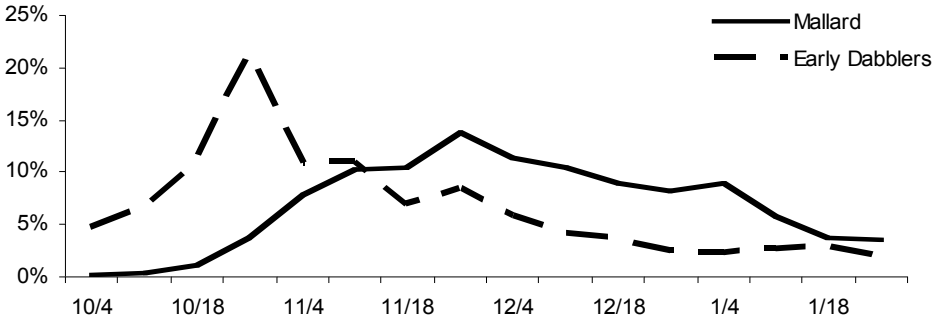
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Advance, MO.



Percent of duck use by week (Duck Creek CA, Otter Slough CA, and Mingo NWR): 30- year average and 5-year average.

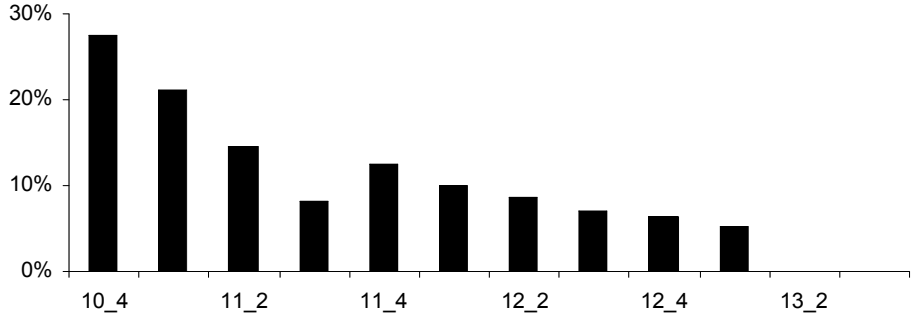


Percent of mallard and early migrant use by week (Duck Creek CA, Otter Slough CA, and Mingo NWR): 30-year average.

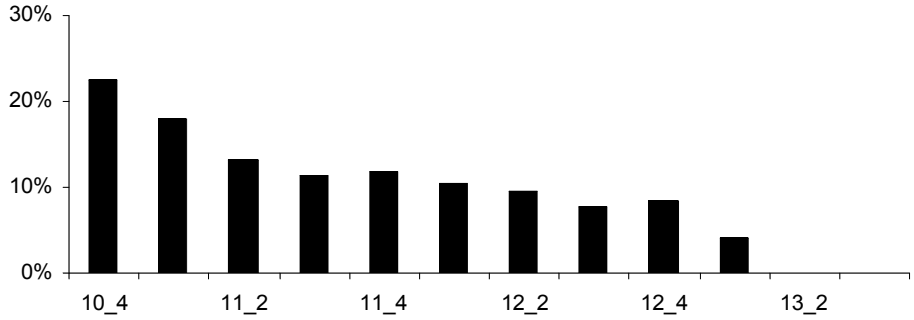


SOUTHEAST: Dry conditions normally prevail through early fall compared to North Missouri. However, increased precipitation occurs during November and December. With increased rainfall and temperatures that remain mild into December, ice conditions do not normally become a factor until after mid-December. A 50% probability for a low temperature of 24° F occurs by November 25 and for a low of 16° F by December 22. A 90% probability of seeing a temperature of 16° F does not occur until January 13, but this is still nearly 2 weeks earlier than Portageville. Duck numbers build steadily through mid-November then decline through December and early January. During the last five years, use has been sustained through mid-January. Early migrants peak during mid-October to early November.

Average daily harvest per week in the Southeast Region based on FWS harvest estimates: 1997-2004.

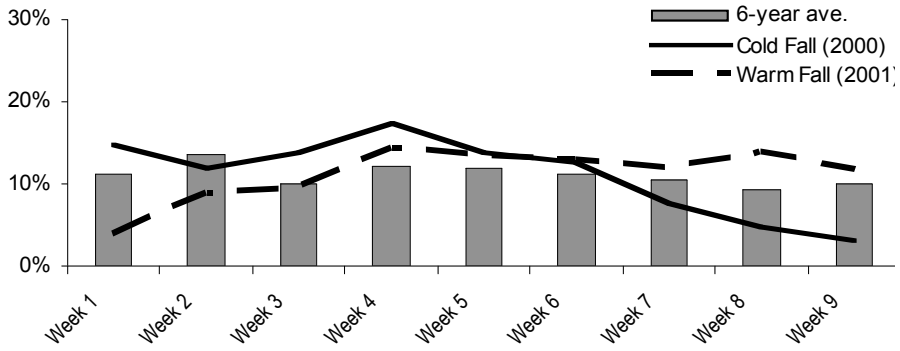


Average daily band recoveries per week in the Southeast Region: 1997-2004 (n=776).

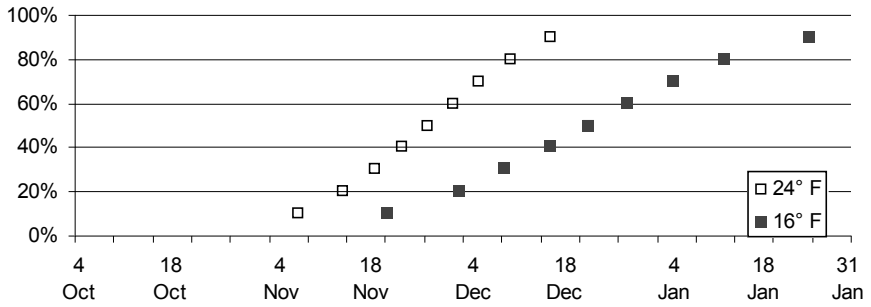


SOUTHEAST HARVEST: Southeast Missouri accounted for 11% of the statewide FWS harvest estimate and 15% of statewide band recoveries during 1997-2004. Large harvest early likely reflects a high level of hunter effort associated with opening weekend, and relative high numbers of early migrant ducks present when the season opens. During the remainder of the season, harvest is fairly stable. The impacts of cold or mild weather are not as severe in this region compared to North Missouri as indicated by the harvest patterns at Duck Creek and Otter Slough in 2000 (a cold year) and 2001 (a mild year) compared to Conservation Areas further north.

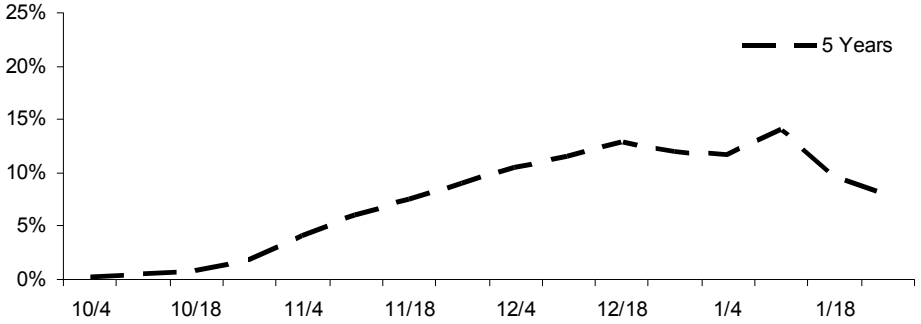
Percent of CA daily hunter trips by week of season at Duck Creek CA and Otter Slough CA: 2000-2005.



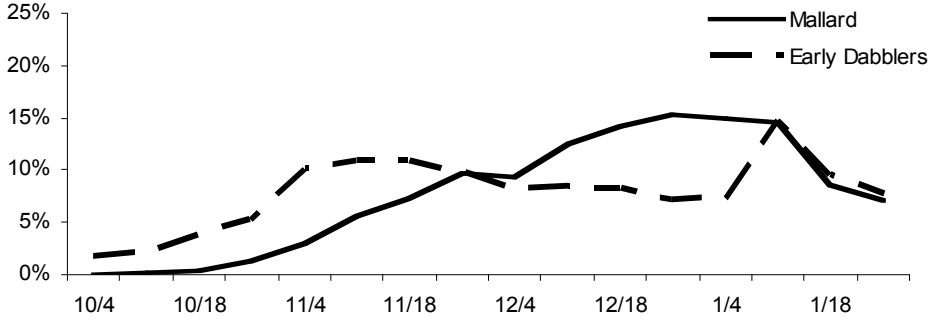
Probability (%) that a temperature of 24° F and 16° F will be reached by date at Portageville, MO.



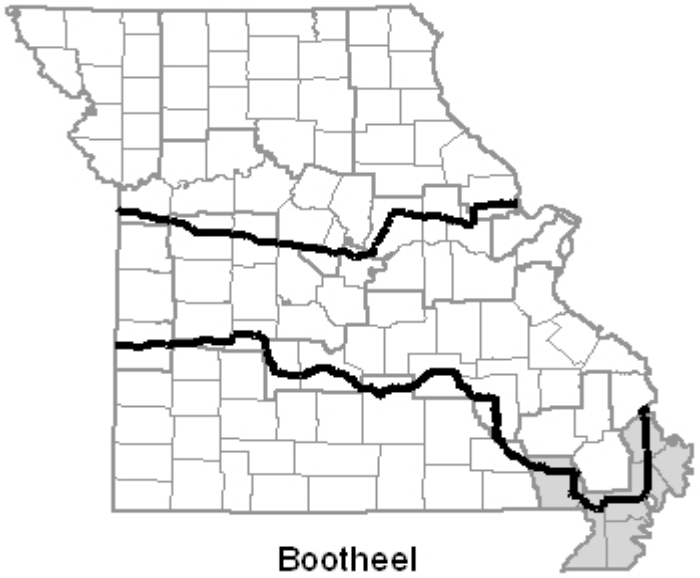
Percent of duck use by week (Ten Mile Pond CA and Coon Island CA): 30- year average and 5-year average.



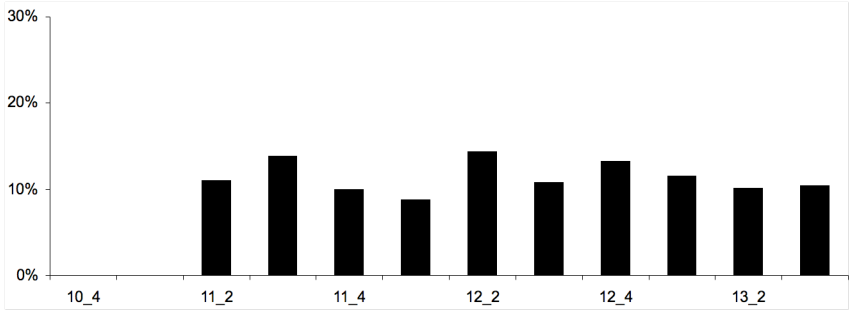
Percent of mallard and early migrant use by week (Ten Mile Pond CA and Coon Island): 30-year average.



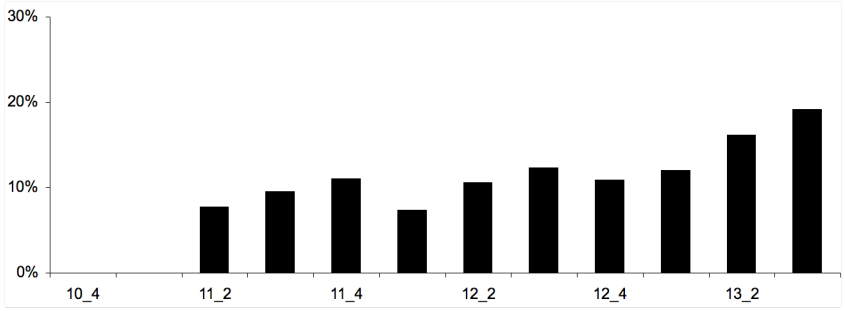
BOOTHEEL: Precipitation patterns reflect the late fall and early winter flooding potential in the Missouri Bootheel. Conditions are normally dry during early fall but rainfall increases in November and December. A 50% probability of seeing a temperature as low as 24° F occurs by November 27, a 50% chance of seeing 16° F does not occur until December 22, and a 90% chance of 16° F does not occur until January 25, nearly 2 weeks later than the Southeast area. Duck use patterns differ from most other areas in Missouri. Late fall and early winter rainfall create "increasing" food availability in wetlands and freeze-up, if it occurs at all, is of short duration. If forced to leave, ducks often move a short distance only and may return in a few days. Only five year data were shown for Ten Mile Pond CA and Coon Island CAs due to their relatively recent development date. Peak use occurs during December and through mid-January.



Average daily harvest per week in the Bootheel Region based on FWS harvest estimates: 1997-2004.

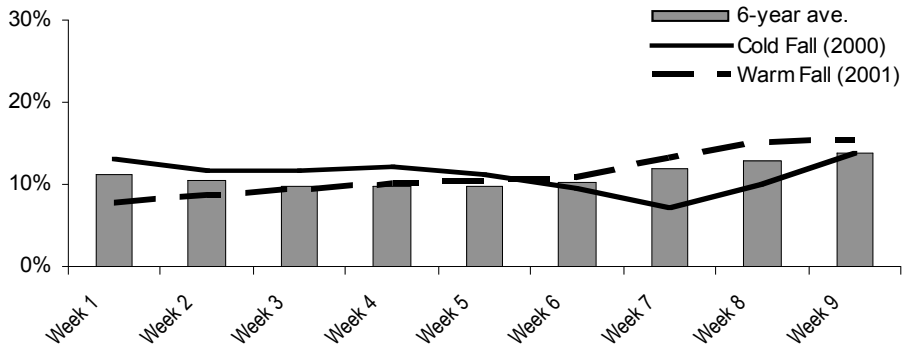


Average daily band recoveries per week in the Bootheel Region: 1997-2004 (n=647).

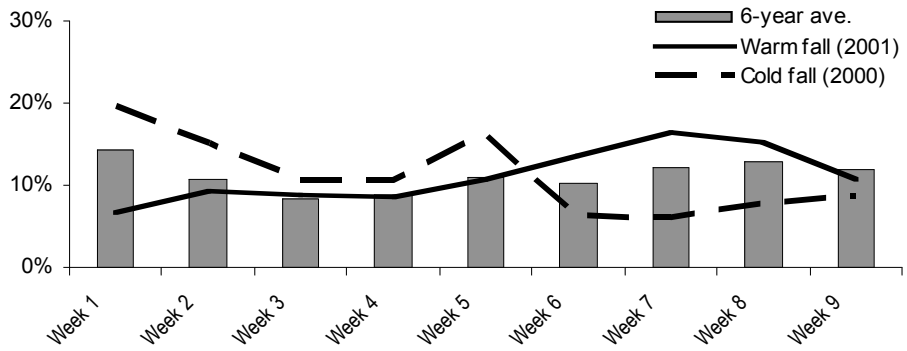


BOOTHEEL HARVEST: The Bootheel accounted for 9% of the statewide FWS harvest estimate and 12% of statewide band recoveries from 1997-2004. Compared to all other regions of Missouri, the Bootheel has the most consistent hunting from the start through the end of season; however, the season opens after many early season migrants have departed Missouri. Peak mallard migrations through Missouri typically occur during the last two weeks of November and the first two weeks of December. Depending on the year, these major migration events may occur before the South Zone season begins and reduce the possibility of hunting "flight days." On the other hand, more habitat is often available later in the season as this is normally a wetter period. Opportunity for late season success is also made possible as birds redistribute in response to freeze/thaw conditions.

Percent of CA daily hunter trips by week of season at Ten Mile Pond CA: 2000-2004.



Percent of CA daily harvest by week of season at Ten Mile Pond CA: 2000-2004.



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